Date: Wed, 10 Nov 93 16:30:16 PST

From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>

Errors-To: Info-Hams-Errors@UCSD.Edu

Reply-To: Info-Hams@UCSD.Edu

Precedence: Bulk

Subject: Info-Hams Digest V93 #1333

To: Info-Hams

Info-Hams Digest Wed, 10 Nov 93 Volume 93 : Issue 1333

Today's Topics:

80m on 20m dipole

Amateur Radio Newsline #847

Falicy of poor generalization. (Was 'Vanity' Call Signs, now paying fo

Kenwood address - info needed

Looking for Hammarlund manual (mine has 3 pages missing!)

MACINTOSH, HAM,

Modify a TV antenna?

need qsl route for ZL2K (cq WW)

Observations on Kenwood TH-78

Poor audio fix for HTs

Questions about Yaesu FT-411E

Readership Report for the Radio-Related Usenet Newsgroups

RS Preferred Customer (Re: Fun with Radio Shack)

This Week On Spectrum

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu> Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu> Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available (by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text herein consists of personal comments and does not represent the official policies or positions of any party. Your mileage may vary. So there.

Date: 10 Nov 93 19:18:12 GMT

From: news.cs.indiana.edu!usenet.ucs.indiana.edu!master.cs.rose-hulman.edu!

news@rutgers.rutgers.edu Subject: 80m on 20m dipole To: info-hams@ucsd.edu

Previously on rec.radio.amateur. misc we heard...

> You are correct. The only case that wire feeders in the shack are when

```
\wedge \wedge \wedge \wedge \wedge \wedge \wedge \wedge \wedge
>
the antena presents a high impeadence load and the the feeders are an
> half wave or a
> multiple half wave length long.
High line currents don't necessarily give "rf in the shack". It depends
on how far from the line the electromagnetic waves are significantly
strong. You think that if ur using coax, there's no problem. Not if the
coax sees a load which causes external fields on the OUTSIDE of the braid.
A low impedance load will do what the above suggests too.
73 de Jack, K9CUN
  -----
Date: Tue, 9 Nov 1993 15:00:17 GMT
From: spsgate!mogate!newsgate!news@uunet.uu.net
Subject: Amateur Radio Newsline #847
To: info-hams@ucsd.edu
In article <2bnrvv$jn1@charm.magnus.acs.ohio-state.edu>
wvanhorn@magnus.acs.ohio-state.edu (William E Van Horne) writes:
> M.Willis@ee.surrey.ac.uk (Mike Willis) writes:
> >> NEWSLINE RADIO - CBBS EDITION #97 - POSTED 11/05/93
> >What 11th May! This is old stuff, why post it now in November?
> >Mike
> Columbus, Ohio 11\09\93
> I believe it was Shaw who said something like: "Britain and the
> U.S. are two countries separated by a common language".
> They are also separated by the fact that Brits always write
> their dates backwards! :-)
> 73, Van - W8U0F
> wvanhorn@magnus.acs.ohio-state.edu
```

And they don't drive on the right side of the road! :-)

73... Mark AA7TA

Date: 10 Nov 93 01:28:35 GMT

From: spool.mu.edu!howland.reston.ans.net!math.ohio-state.edu!

cyber2.cyberstore.ca!nntp.cs.ubc.ca!alberta!atha!aupair.cs.athabascau.ca!

rwa@decwrl.dec.com

Subject: Falicy of poor generalization. (Was 'Vanity' Call Signs, now paying fo

To: info-hams@ucsd.edu

dadams@cray.com (David Adams) writes:

>[sorry, botched the attrib; Ross] writes:

>|things, this argument is absurd. To say that kids would not be able to >|afford a cost roughly equivalent to the cost of a CD makes me laugh. Go to >|N30XM

>This is like saying that given the millions that all these OMs spend on >Yaesu, ICOM, and Kenwood equipment, it is absurd to think that all hams >can not afford new TS-50s.

Is it? This is a leap of rather a large order. If \$15 is keeping someone (even a child) out of the hobby, they have much worse problems which they should deal with ASAP, and get their lives into order.

>Think.

I am. Hell, I made \$20/week back in the 60's, as a 12 year old. I had a good sized newspaper route. Has the economy collapsed utterly? Why do I see so many kids wearing \$100 sneakers?

Americans talk a wonderful line about self-determination, go-getting, and the wonders of the free market. Then they turn around and moan about paying pocket change for a license. Wake up you WANKs, the rest of the world thinks of you as whiners.

regards, Ross ve6pdq

- -

Ross Alexander,rwa@cs.athabascau.ca,(403) 675 6311,ve6pdq@nebulus.ampr.ab.ca
"Arguably worse, the compiler can produce any result it deems fit, up
to and including the start of World War III (assuming the right
optional hardware has been installed)." -- Fortran FAQ

Date: Tue, 9 Nov 1993 06:44:25 GMT

From: saimiri.primate.wisc.edu!hp9000.csc.cuhk.hk!hkuxb.hku.hk!hkuxa.hku.hk!

pckwong@ames.arpa Subject: Kenwood address - info needed To: info-hams@ucsd.edu Jonathan Bucki (buckij@mari.acc.stolaf.edu) wrote: : Greetings, : I haven't used my HT for about a year and a half. When I dug it out of the : box I found that I didn't have the manual. Could someone either post : or send me Kenwood's USA address? Or if there is an electronic version of : the TH-26AT manual somewhere, where can I find it? : jonathan bucki : n9mks : p.s. if you own one of these, and are feeling a bit kind, please send me : a few instructions, I'm completely lost and I don't know anyone who has : a TH-26AT in this area. It's that simple, go to a HAM shop, check from some later KENWOOD models, find out the address from the manual, or tell the story and seek for help. It's that simple. Good luck!

73, VS6XVI

Date: 8 Nov 93 23:21:28 GMT

From: sdd.hp.com!vixen.cso.uiuc.edu!howland.reston.ans.net!noc.near.net!ceylon!

bunny!jp07@decwrl.dec.com

Subject: Looking for Hammarlund manual (mine has 3 pages missing!)

To: info-hams@ucsd.edu

I'm looking for someone with the "Instruction and Service Information" manual for a Hammarlund HX-500 Transmitter. My copy is missing pages 13, 14, & 37 (a schematic). If you can help out, via fax or mail, I'll pre-pay the phone call or postage.

Thanks for any help. -Jim.

Date: 7 Nov 93 17:30:53 GMT

From: psinntp!wlnntp.psi.com!usenet@uunet.uu.net

Subject: MACINTOSH, HAM, To: info-hams@ucsd.edu

Or... feel free to e-mail direct and I'll forward you my latest version

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that I am working on.
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when there are significant changes. There are a couple of new entries this month... stay tuned. >DATE: Sun, 31 Oct 1993 13:52:23 GMT >FROM: Scott Ehrlich <wy1z@chopin.coe.northeastern.edu> >In article <19930ct28.204450.11696@krk.fi> tofi@krk.fi (Kristoffer H{ggstr|m) writes: Newsgroups: rec.radio.amateur.misc Path: lynx!noc.near.net!howland.reston.ans.net!europa.eng.gtefsd.com!uunet! pipex!sunic!trane.uninett.no!news.eunet.no!nuug!news.eunet.fi!fuug!krk! krksun.krk.fi!tofi From: tofi@krk.fi (Kristoffer H{ggstr|m) Sender: usenet@krk.fi > Nntp-Posting-Host: krksun.krk.fi > Organization: Radio Club of Kauniainen (OH2NRG) > X-Newsreader: TIN [version 1.1 PL9] > > Date: Thu, 28 Oct 1993 20:44:50 GMT Lines: 12 > > Hi there!! > > I would like to know if there is any programs on the Macintosh > > to help HAMs to keep their log????? > ----> > > Kristoffer H{ggstr|m > tofi@krk.fi > PS. please reply to my personal address. > >Sorry, but I have opted to post to Usenet for the benefit of everyone >else. >I'm not sure where logging programs for the Macintosh might reside, but >the ARRL has a nice listing of s/w available for the Mac. >You can get the info via e-mail from: info@arrl.org, with the body of the >message containing: send software-mac >or you could FTP into: world.std.com, in the directory: >/pub/hamradio/arrl/Server-files

I am updating the list mentioned by Scott... and will have the latest version out to the net real soon. I am only posting the list to the net

```
>
>The ARRL files on World are updated as often as the ARRL sends me the
>updated versions of what they put on their server.
>Hope this helps.
>73,
>Scott
> | Amateur Radio: wy1z
                          AX.25: wy1z@wa1phy.#ema.ma.usa.na
>|-----|
>| Maintainer of the Boston Amateur Radio Club hamradio FTP area on
>| the World - world.std.com /pub/hamradio
                                                 Terry M. Stader, KA8SCP, America Online (AOL) Ham Radio Club Host
Macintosh Amateur Radio Software List Maintainer
Internet: tstader@aol.com or p00489@psilink.com
Packet: KA8SCP@WA1PHY.#EMA.MA.USA.NOAM
Date: 10 Nov 93 16:21:01 GMT
From: ogicse!emory!darwin.sura.net!fconvx.ncifcrf.gov!fcs260c!
mack@network.ucsd.edu
Subject: Modify a TV antenna?
To: info-hams@ucsd.edu
In article <CGA8n6.4q0@ryn.mro4.dec.com> randolph@est.enet.dec.com (Tom Randolph)
writes:
>In article <jbruni.1103292162C@156.151.254.10>, jbruni@sfe.com (John R. Bruni)
writes...
>>Is it possible to modify a standard TV antenna (coax) to handle 2 meter
>>xmit/rcv? I assume this would require a balun at the least...
>
>Yup, I'm in the process of doing this now. I'm not sure what exactly you mean
>when you say "standard TV antenna", but I'm doing this to a rooftop-type TV
>beam, which started life as a log-periodic. It's now a Yagi.
>The problems occur when you decide to transmit through what is a receive-only
>antenna. If you feed it with coax, you'll need to somehow match the 50-ohm coax
>to the ??-ohm antenna to get a decent SWR, and you'll need to figure out how to
>do a balun. The TV balun will probably fry if you put any kind of wattage into
>it, and it's for 75 ohm coax with F-connectors.
```

> 2m would probably work ok on a full-size TV log periodic, once all of the above >is taken care of, since the VHF TV bands straddle the 2m band, and >log-periodics have continuous coverage from their highest to lowest freq. > I decided to rebuild mine entirely, as I said it's now a 5-element Yagi. I'm >working on the balun/matching device now. I'm going with a 1/2-wave coax >balun and a hairpin match, after playing for several days with a gamma match >without much success. See the antenna handbook for details of these. >-Tom R. N100Q randolph@est.enet.dec.com

Assuming the point is to have a 2m antenna, rather than the object being to modify an existing antenna, why not get a design (somewhere, ARRL handbook if nowhere else), by the boom feedthroughs and brackets from say Rutland Arrays (advertise in QST, Tom says he sells the hardware if you want it), buy some 6061 Al tubing and rod from your local metal tubing supply store (big cities only) and then you're at the point of the proevious writer above and put the hairpin on it. It's not trivial, but I imagine it's no harder than doing major surgery on an existing antenna.

Joe MAck (NA3T)
mack@ncifcrf.gov

Date: 10 Nov 93 16:31:02 GMT

From: ogicse!uwm.edu!spool.mu.edu!sdd.hp.com!hpscit.sc.hp.com!cupnews0.cup.hp.com!

jholly@network.ucsd.edu

Subject: need qsl route for ZL2K (cq WW)

To: info-hams@ucsd.edu

eric.s.hellman (hellman@cbnewsm.cb.att.com) wrote:

: He's not in the 93 callbook (ZL2K)

: tnx 73 Shel WA2UBK dara@physics.att.com

For the simple reason its a contest call. QSL via bureau to ZL2IR. Jim Hollenback, WA6SDM jholly@cup.hp.com

Date: Tue, 9 Nov 1993 06:34:56 GMT

From: saimiri.primate.wisc.edu!hp9000.csc.cuhk.hk!hkuxb.hku.hk!hkuxa.hku.hk!

pckwong@ames.arpa

Subject: Observations on Kenwood TH-78

To: info-hams@ucsd.edu

FORRELL (FORRELL@130.187.198.34) wrote:

: In <CFvzJ8.KDt@kaiwan.com> andrew@kaiwan.com writes:
:
: > dissappointed....... the disgustingly poor intermod rejection,
: > the battery life was nil, even though it was a fresh battery that
: > had been fully charged the day before. I think it died on me within
: > about 4 hours, and I wasn't talking all that much.
:
:
: I agree with your front end intermod observations, however, in my area
: its not much of a problem. What is unusual is the poor battery performance.
: I find it hard to run mine down! I have the 1100 ma extended battery pack
: and it never seems to go down. I have owned several HT's and the TH-78
: has the best battery life of anything I've owned.
:
: My only complaint with the thing is I can't remember how to do all the

: My only complaint with the thing is I can't remember how to do all the : features unless I have a manual with me.

Why? Mine is completely different! The intermod rejection is between satisfy and good, you know, the VHF band from 138-174 (except 144-6 for HAMs) is fully utilized for commercial, so congest. I think HK is a good "test field" for HTs. About the battery discharge life, I use a 700mAH battery pack and it lasts 10 hr. of Rx and 4-5 hrs of operation on a mix of Tx/Rx. What's wrong on your TH-78A? Or the battery?

Philips Wong, 73, VS6XVI

: Fred Orrell : WB5NOE

Date: 10 Nov 93 22:08:49 GMT From: news-mail-gateway@ucsd.edu Subject: Poor audio fix for HTs

To: info-hams@ucsd.edu

Hello everyone:

A common complaint about the newer micro handhelds is the low volume audio. There is a fix to that problem, which I have applied to my Kenwood TH-78A. I use a CD Player-to-Cassette adapter (Radio Shack 12-1951), it plugs into the headphone jack of the HT and the adapter loads like a cassette into the car stereo system. With this setup one hears the HT audio amplified by the car stereo, so there is plenty of power available. Also it is possible to modify audio tone with the stereo controls.

Date: Mon, 8 Nov 1993 16:52:26 GMT

From: munnari.oz.au!spool.mu.edu!howland.reston.ans.net!math.ohio-state.edu!

sdd.hp.com!hpscit.sc.hp.com!hplextra!hpfcso!ajs@network.ucsd.edu

Subject: Questions about Yaesu FT-411E

To: info-hams@ucsd.edu

> ...the 411E has the Tone Encode/Decode board built-in, where it is > extra for the 411.

My 411, at least, came with it already built in. I'm pretty sure the 411E addressed the poor (for the US anyway) choice of IF, by raising it and thereby reducing intermod.

Date: Wed, 10 Nov 1993 17:44:23 GMT

From: library.ucla.edu!agate!spool.mu.edu!sol.ctr.columbia.edu!news.unomaha.edu!

news@network.ucsd.edu

Subject: Readership Report for the Radio-Related Usenet Newsgroups

To: info-hams@ucsd.edu

The following is reprinted from news.lists, with only the radio-related newsgroups (and the first newsgroup for comparison) included.

>From: reid@decwrl.DEC.COM (Brian Reid)

>Newsgroups: news.lists

>Subject: USENET Readership report for Oct 93

>Date: 8 Nov 1993 15:26:14 GMT

>Organization: DEC Network Systems Laboratory

>Summary: data for all groups

>Keywords: arbitron, statistics, full

This is the full set of data from the USENET readership report for Oct 93. Explanations of the figures are in a companion posting.

```
V
  1 470000 6439 90%
                      17 163.1 100% 0.00 12.6% news.announce.newusers
277
     68000
            927 77% 1594 3977.4
                                 7% 0.07 1.8% rec.radio.amateur.misc
296
     65000
            888 77%
                    812 2035.3
                                 9% 0.04 1.7% rec.radio.shortwave
393 59000
           804 75%
                    488
                        534.3
                                 5% 0.01 1.6% rec.radio.swap
657 45000
            610 75%
                    585 1045.6
                                 0% 0.03 1.2% rec.radio.amateur.policy
696 43000
           589 60%
                    247
                         307.4
                                12% 0.01 1.1% alt.radio.scanner
                                 4% 0.02 1.0% rec.radio.info
864
     38000
            523 64%
                    151
                         897.1
867 38000
           522 76%
                      67
                         127.5
                                10% 0.00 1.0% rec.radio.noncomm
            468 57%
                                          0.9% rec.radio.amateur.packet
1018 34000
1024 34000
                                11% 0.01 0.9% rec.radio.amateur.homebrew
            466 55%
                    158
                         251.8
1034 34000
                                13% 0.01 0.9% rec.radio.cb
            462 73%
                    140
                         315.4
                                17% 0.02 0.9% rec.radio.scanner
1048 33000
            457 48%
                     532 911.3
1082 32000
           443 56%
                    376 796.4
                                 8% 0.02 0.9% rec.radio.amateur.digital.misc
                                 1% 0.01 0.8% rec.radio.amateur.antenna
1113 31000 430 54%
                    312 525.5
1125 31000
                        209.7
                                 1% 0.01 0.8% alt.radio.pirate
           426 54%
                     98
1164 30000
            414 67%
                    414 947.3
                                 1% 0.03 0.8% rec.radio.broadcasting
1194 30000
           404 54%
                         296.6
                                6% 0.01 0.8% rec.radio.amateur.equipment
                    207
1202 29000
            402 54%
                    139 590.5 49% 0.02 0.8% rec.radio.amateur.space
2025 15000 200 30%
                    121 153.0
                                 0% 0.00 0.4% alt.radio.networks.npr
2111 13000 179 31%
                      9
                           6.2 22% 0.00 0.3% rec.ham-radio.swap
2128 13000 175 32%
                      4
                           4.3
                                 0% 0.00 0.3% rec.ham-radio
2205 11000
            155 28%
                          11.5
                                 9% 0.00 0.3% rec.ham-radio.packet
                      11
```

Several positive trends continue this month. Readership is up dramatically in all active newsgroups (closely following Usenet's predicted exponential growth patterns). The two top newsgroups, rec.radio.amateur.misc and rec.radio.shortwave, are roughly tied, as as they were last month. Other newsgroups with extremely strong showings are rec.radio.swap and rec.radio.amateur.policy (meeting their respective goals of keeping for-sale messages and extended legal debate out of the main discussion newsgroup). Currently, rec.radio.amateur.homebrew leads the other new rec.radio.amateur newsgroups by a significant margin. The recently-created rec.radio.scanner is slowly gaining in readership as well, and should eventually overtake alt.radio.scanner, which it supersedes. It is expected that the newly-created newsgroups will continue to grow in readership like previously-created newsgroups such as rec.radio.info and settle out at about 60-70% propagation. If these new radio-related newsgroups still haven't reached your site, please ask your news administrator to create them (refer him/her to the new newsgroup announcements by Dave Lawrence in news.announce.newgroups or the messages posted to the new newsgroups piling up in "junk" :-). Especially point out to him/her that cost/per-reader/per-month is significantly down in all newsgroups.

The defunct newsgroup rec.radio.amateur.packet has been rmgrouped as of September 21st, 1993, and is no longer connected to the PACKET-RADIO mailing list. Netters interested in packet-radio discussion should use rec.radio.amateur.digital.misc and the HAM-DIGITAL mailing list. Propagation has started to gradually drop in the old newsgroup, down 2 points from last month. There is a Usenet Request for Discussion (RFD) tentatively scheduled for January 1994, to either reconsider the rec.radio.amateur.digital.tcp-ip vote, merge all digital interests into rec.radio.amateur.digital, or possibly even revert back to rec.radio.amateur.packet. Watch news.announce.newsgroups (or subscribe to the rec.radio.amateur Working Group mailing list at rra-wg-request@amdahl.com) for further developments.

Note also that the defunct rec.ham-radio hierarchy reappears this month. If the newsgroups are still active at your site, please try to persuade your your news administrators to delete them as these groups have been rendered obsolete (for almost 3 years now) by the rec.radio.amateur hierarchy.

- -

73, Paul W. Schleck, KD3FU

pschleck@unomaha.edu

Date: 10 Nov 93 16:16:25 GMT

From: dziuxsolim.rutgers.edu!gandalf.rutgers.edu!troch@uunet.uu.net

Subject: RS Preferred Customer (Re: Fun with Radio Shack)

To: info-hams@ucsd.edu

>>>> "Thomas" == Thomas Collins WI3P <collinst@esvx19.es.dupont.com> writes:

Thomas> I would not pay the \$3.00. Instead I spent .29 on a Thomas> letter of complaint to RS at Fort Worth, TX and about Thomas> 3 weeks later what came in the mail. A RS catalog and Thomas> a letter of apology for the "shabby treatment" I Thomas> received in the store. It was sort of funny, I never

I didn't pay for my catalog either. I didn't have to resort to writing to Radio Shack (albeit it does sound like a good idea any way) instead I used the free catalog coupon that came enclosed in the mail with my Radio Shack Preferred Customer Discount Card. (whew!)

What makes me a "Preferred Customer" I don't know. Maybe that I pay for the things I buy! :-)

gig'em, Rod - -

--PGP 2.3 Public Key Available (finger me or ask for it)
If you yell try : Rod Troch | Zeta Beta Tau

internet : troch@gandalf.rutgers.edu

bitnet : troch@zodiac | happyHappy joyJoy Rutgers University - Faculty of Arts and Sciences / History Dept.

- Microcomputer Analyst (Network Admin)

Date: 10 Nov 93 03:53:05 GMT

From: starcomm!spectrum@uunet.uu.net

Subject: This Week On Spectrum

To: info-hams@ucsd.edu

Spectrum is going "Down Below".

This week on Spectrum we will feature an interview with Dave Curry. Dave is an expert on longwave communications and is active on the experimenters band, (160 through 190KHZ). We are going to talk about the frequency spectrum below the broadcast band and how you can build your own vlf experimental station.

- -

Spectrum, "The Communications Magazine You Read With Your Ears." WWCR, Nashville, TN, USA, 5810 KHz.

Lets Talk Radio Network, Spacenet III, Transponder 21, 5.8 MHz Wide Band Audio 03:00 UTC Sunday, 22:00 EST Saturday.

Box 722, Holmdel, NJ, 07733-0722, USA

spectrum@overleaf.com, askspectrum@attmail.com, spectrumshow@genie.geis.com
+1 800-787-SPECTRUM, +1 908-671-4209

Date: Tue, 09 Nov 1993 15:49:48 GMT

From: yuma!galen@purdue.edu

To: info-hams@ucsd.edu

References <2blvfq\$6m6@pith.uoregon.edu>, <8NOV199313080974@zeus.tamu.edu>, <931108.79382.GREGL@delphi.com>usenet.i

Subject : Re: Care and Feeding LARGE Gel-Cells?

In article <931108.79382.GREGL@delphi.com> Greg Law <GREGL@delphi.com> writes: >Somewhat along the same lines. . .

>I purchase two Panasonic LCR12V2.2P lead-acid batteries for use with the >HTX-202. These are fairly nice 2.2 amp/hour batteries that are about the same

A little editing (he's using an automobile batt charger)
>this charger seems to be working well but it's a manual type and I'm not
>sure how long I should charge the batteries. What I've been doing is letting
>the battery drop to about 10 to 10.5 volts then throwing it on the charger
>and checking it every 30 minutes to an hour with a DMM. When the battery
>voltage increases to about 12 volts, I remove them from the charger and
>put them back in the carrying case.

>One thing is absolutely accurate: I could use some tips on charging lead-acid >batteries. The particular ones I have are stamped "Constant Voltage Charge" >with the ratings "cycle use: 14.6-15.0V and standby use: 13.6-13.8V." Inital >charge current is rated at 0.88A.

> -- Greg KE4DPX

According to some info I have from PowerSonic(TM), a lead-acid battery is at 100% charge when the battery 'relaxes' to 12.75 volts. By 'relaxing', the voltage on the battery will drop after a charger is disconnected, leveling off at a certain voltage after some time. This level value is the 'relaxed' value.

They have a small chart that lists 12.75 volts as 100%, going down to 12.2 volts as 45%, each 0.05 volts corresponding to 5%. This would lead you to believe that any voltage below 11.75 volts as a dead battery. The literature goes on to say that the batteries should not have a large current draw when the voltage drops below 11.90 volts. It also says to get the longest life, keep the battery voltage at least 12.45 volts or 70% charge.

See the article in the ARRL handbook (I have the 87 edition handy) titled "Controlled Battery Charger for Emergency Power Supplies". It has a charger circuit that controlls the charging voltage for deep cycle batteries.

I charge mine with solar panels and a charge controller from SCI.

I would not use a battery that's below 12.0 volts under load. Sometimes they don't come all the way back up.

Fun	is	the	operative	concept	here,
Galen,		KF0YJ			